
Two New Species and Two New Combinations in *Rhynchospora* Sect. *Pluriflorae* (Cyperaceae)

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ABSTRACT. While revising *Rhynchospora* sect. *Pluriflorae* Kükenthal, two species new to science were discovered and are described here. Furthermore, two new combinations are proposed, and lectotypifications of two of Kükenthal's names are proposed. The morphological variability of the species is discussed and related to their geographic distribution.

RESUMO. Durante a revisão taxonômica de *Rhynchospora* sect. *Pluriflorae* Kükenthal, foram encontradas duas novas espécies para a Ciência, as quais estão sendo descritas neste trabalho. Além disso, duas novas combinações estão sendo propostas. São também propostas a lectotipificação de duas espécies de Kükenthal. A variabilidade morfológica das espécies é discutida e relacionada com dados de distribuição geográfica.

Key words: Brazil, Cyperaceae, *Rhynchospora* sect. *Pluriflorae*.

Rhynchospora Vahl is the third largest genus of Cyperaceae, with approximately 250 species, and is most diverse in the Neotropics (Thomas, 1994; Koyama, 1972). In his revision of the genus, Kükenthal (1949) accepted two subgenera: subg. *Rhynchospora*, characterized by a bifid style, and subg. *Haplostylis* (Nees) Pax, characterized by an entire or briefly divided style. The subgenus *Haplostylis* comprises seven sections arranged in two informal groups, Anthelatae and Capitatae, the latter with two sections, *Pauciflorae* and *Pluriflorae*. Section *Pluriflorae* can be recognized by characters of the inflorescence, perigonal bristles, and achenes. The species of section *Pluriflorae* occur

exclusively in the Neotropics, especially in Brazil between 500 and 2000 m, mainly in savannas, including the cerrado, and campo rupestre vegetation.

While revising *Rhynchospora* sect. *Pluriflorae*, the review of herbarium collections, analysis of populations in the field, and studies of leaf anatomy revealed species new to science and made necessary the change in rank of some previously recognized taxa. In this paper, two species are described and two new combinations are proposed.

Rhynchospora eurycarpa A. C. Araújo & H. M. Longhi-Wagner, sp. nov. TYPE: Brazil. Mato Grosso: Mun. Rondonópolis, BR 163, 113 km após a cidade, 500 m após a Polícia Rodoviária em direção a Cuiabá, 26 Nov. 1997, A. C. Araújo, A. Zanin, M. G. L. Wanderley, R. Forzza & Rita Lima 933 (holotype, ICN; isotypes, NY, SPF). Figure 1.

Rhynchosporae hispidulae proxima sed glumis pallidis (nec castaneis), setis perigonii carentibus, fructu latiori 1.7–2.3 mm (nec 1.4 mm), margine fructus apicem versus tantum curvatum et styli basi late triangulari distat. Proxima etiam *R. elatiori* sed laminis crescentiformibus (nec planis), bracteis involucri angustioribus 0.3–0.9 mm (nec 1.5–5 mm) latis, spiculis latioribus 2.5–3 mm (nec 1–2.2 mm) latis et setis perigonii carentibus distat.

Plants 40–70 cm tall, erect. Culm 1 mm wide, cylindrical, rarely triangular, glabrous, the culm bases sub-bulbiform and 0.7–1 cm wide. Leaves basal, (3)5 to 8; sheath 4–5(7) cm long, becoming fibrous when old, glabrous, rarely pilose at the apex; blade (15)20–40 cm × (0.4)1.2–1.8 mm, at least half the height of the culm, linear, convolute, gla-

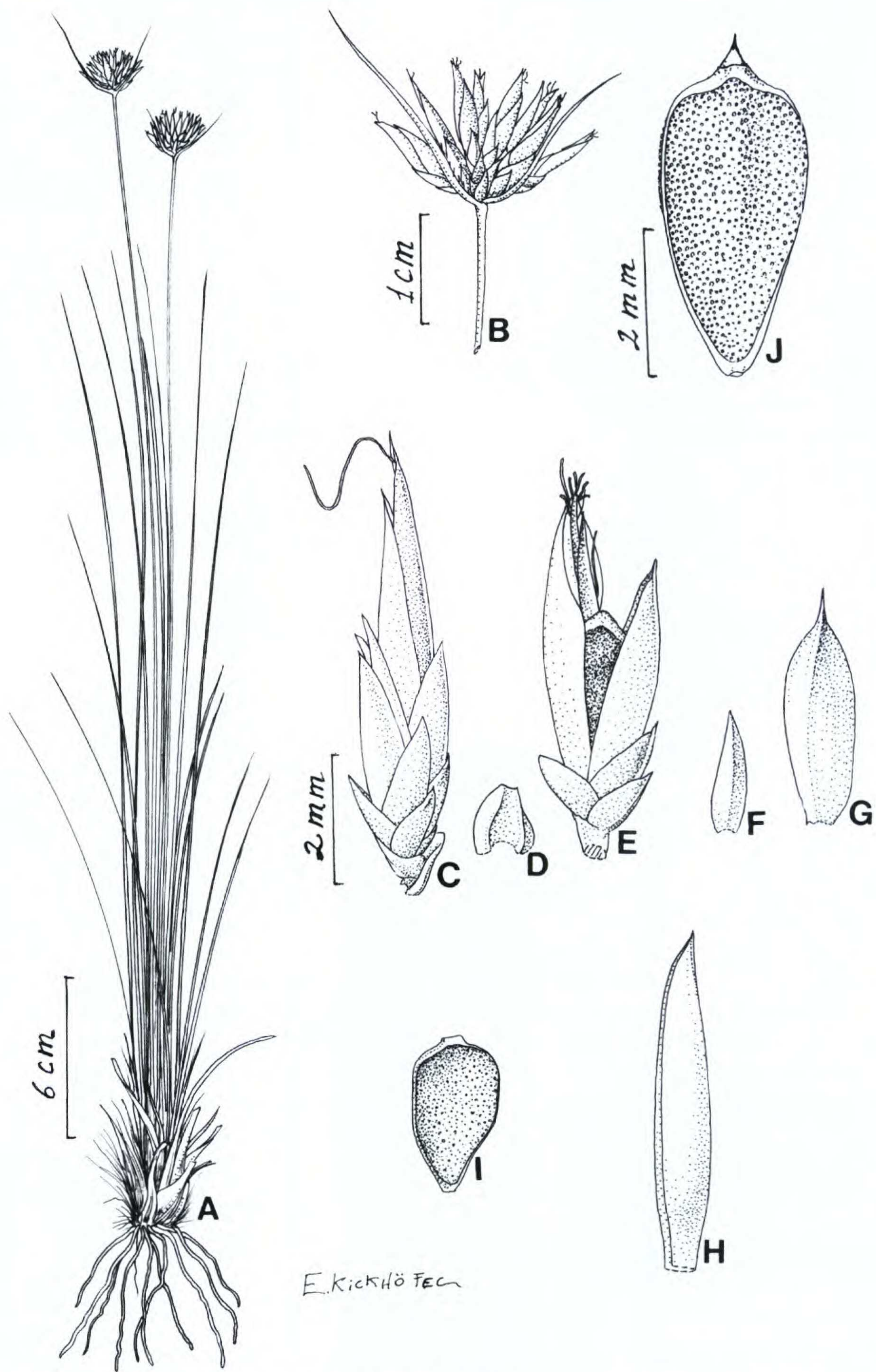


Figure 1. *Rhynchospora eurycarpa* A. C. Araújo & H. M. Longhi-Wagner. —A. Habit. —B. Capitulum. —C. Closed spikelet. —D. Prophyll. —E. Opened spikelet revealing achene. —F. Empty basal spikelet scale. —G. Spikelet scale subtending achene. —H. Spikelet scale subtending lowest staminate flower. —I, J. Achene. (Based on A. C. Araújo 933.)

Table 1. Diagnostic characters for *Rhynchospora eurycarpa* A. C. Araújo & H. M. Longhi-Wagner, *R. elatior* Kunth, and *R. hispidula* Grisebach.

Characters	<i>R. eurycarpa</i>	<i>R. elatior</i>	<i>R. hispidula</i>
Leaf blade	crescentiform	flat	flat
Bulliform cells	absent	present	present
Involucral bract width	0.3–0.9 mm	1.5–5 mm	1–1.4 mm
Spikelet width	2.5–3 mm	1–2.2 mm	1.8–2 mm
Achene width	1.7–2.3 mm	0.9–1 mm	1.4 mm
Perianth bristles	absent	6, scabrous	6, scabrous

brous on both surfaces, scabrous along the margins. Inflorescence capitate subtended by 2 or 3 involucral bracts; involucral bracts similar to leaf blades, linear, flat, green, coriaceous; first bract 1.5–3(4.5) cm × 0.3–0.9 mm, the margins scabrous; second bract 0.7–1.8 cm × 0.3–0.6 mm. Capitulum 7–12 × 10–20 mm, hemispherical. Spikelets (6)10–20, 7–8 × 2.5–3 mm, lanceolate, the basal 3 or 4 scales empty, followed by 1 scale (rarely 2) subtending a perfect flower, and 5 to 7 distal scales subtending staminate flowers; distal empty scale stramineous to creamy white, chartaceous, 3–5 × (1)2–2.7 mm, ovate-lanceolate, glabrous, mucronate at the apex; scale of the perfect flower 5–7 × 2.7–3.6 mm, ovate-lanceolate, stramineous to creamy white, chartaceous, glabrous, the apex acute or apiculate; scale of the basal staminate flower stramineous to creamy white, chartaceous, glabrous, the other staminate scales membranous. Perianth bristles absent. Anthers 2 or 3 mm long. Achenes 3.8–5.8 × 1.7–2.3 mm, widely obovate, laterally compressed, dark brown, the surface papillose, the margins cartilaginous, sparsely scabrous; style base 0.3–0.4(1.2) × 0.8–1 mm, triangular with an abrupt constriction near the base, not decurrent, its insertion confluent with the summit of the achene, the margins straight.

Rhynchospora eurycarpa is known only from the cerrado in the central-western region of Brazil. This species is similar to *R. elatior*, from which it differs in having a wider achene, shorter style base, and narrower involucral bracts. The foliar anatomy of these two species also differs (Table 1).

Paratypes. BRAZIL. **Goiás:** Mun. Mineiros, Parque Nacional das Emas, 3 Jan. 1993, *F. A. Vitta et al.* 173, 199 (SPF); estrada de acesso à sede do Parque, em direção ao portão Jacuba, próximo ao Rio Formoso, 25 Nov. 1997, *A. C. Araújo et al.* 917 (SPF). **Mato Grosso:** Mun. Chapada dos Guimarães, 7 Jan. 1979, *A. Maciel* 15 (INPA); Colégio de Buriti, 720 m, 13 Oct. 1973, *G. T. Prance et al.* 18923 (NY); Mun. Cuiabá, rodovia para Santarém/Porto Velho, arredores do aeroporto, *M. G. Silva & A. Pinheiro* 4530 (CH); Mun. Dona Rosa, 12°54'S, 51°52'W, 270 km N de Xavantina, Oct.–Nov. 1967, *J.*

Ramos & R. Souza 195 (NY); 12°49'S, 51°46'W, 9 Jan. 1968, *D. Philcox & A. Ferreira* 3943 (NY, RB); Mun. Rio Brillhante, Casa Branca, 12 Feb. 1970, *G. Hatschbach* 23619 (NY); BR 267, no entroncamento do município, 22 Oct. 1970, *G. Hatschbach* 25029 (MBM, NY); rodovia Presidente Prudente, em direção a Campo Grande, km 180, 9 June 1976, *H. F. Leitão Filho et al.* 2094 (UEC); Mun. Xavantina, rodovia para Cachimbo, km 247,5 E da rodovia, 8 dec. 1967, *D. Philcox et al.* 3440 (NY). **Mato Grosso do Sul:** Mun. Campo Grande, BR 163, próximo de Água Ruim, 14 Aug. 1970, *G. Hatschbach & O. Guimarães* 24635 (MBM).

Rhynchospora paranaënsis A. C. Araújo & W. W. Thomas, sp. nov. TYPE: Brazil. Paraná: Mun. Ponta Grossa, Vila Velha, 7 Oct. 1971, *G. Hatschbach* 22332 (holotype, MBM; isotypes, HB, MO, RB, UEC, US). Figure 2.

Rhynchosporae warmingii affinis sed laminis planis (nec convolutis), nec fibrosis senescentibus, bracteis involucris brevioribus, bractea basali ad basin magis late-centi 2.4–3.2 mm longa (nec 1–2.2 mm), setis perigonii carentibus differt.

Plants 20–30 cm tall, erect, rhizomatous with knotted rhizomes, the knots 0.6–1 cm wide. Culm 0.8–1 mm wide, cylindrical, glabrous. Leaves 2 or 3; sheath 5–8 cm long, not becoming fibrous when old, glabrous; blade 10–17 cm × 2.4–2.7 mm, half the height of the culm, linear-lanceolate, symmetrical, flat, the margins scabrous or sparsely hairy. Inflorescence subtended by 2 involucral bracts; involucral bracts foliar, basally white and ovate, distally green and linear-lanceolate, flat, chartaceous, the apex acuminate; basal bract 2.4–3.2 cm long, the white portion 0.5 × 0.4–0.6 cm, the green portion 1.9–2.7 × 0.8 cm, the margins scabrous; second bract 1.5 × 0.6 cm. Capitulum 6–8 × 8 mm, hemispheric. Spikelets 10 to 15, 4.4–5.4 × 1.8–2.4 mm, ovate to ovate-lanceolate, the basal 3 scales empty, followed by a single scale subtending a perfect flower and 3 to 6 distal scales subtending staminate flowers; distal empty scale 4–4.6 × 1.8–2 mm, lanceolate, ochraceous, glabrous, the apex acute; scale of the perfect flower 4.4–5 × 2–2.5 mm, ovate-lanceolate, ochraceous, chartaceous,

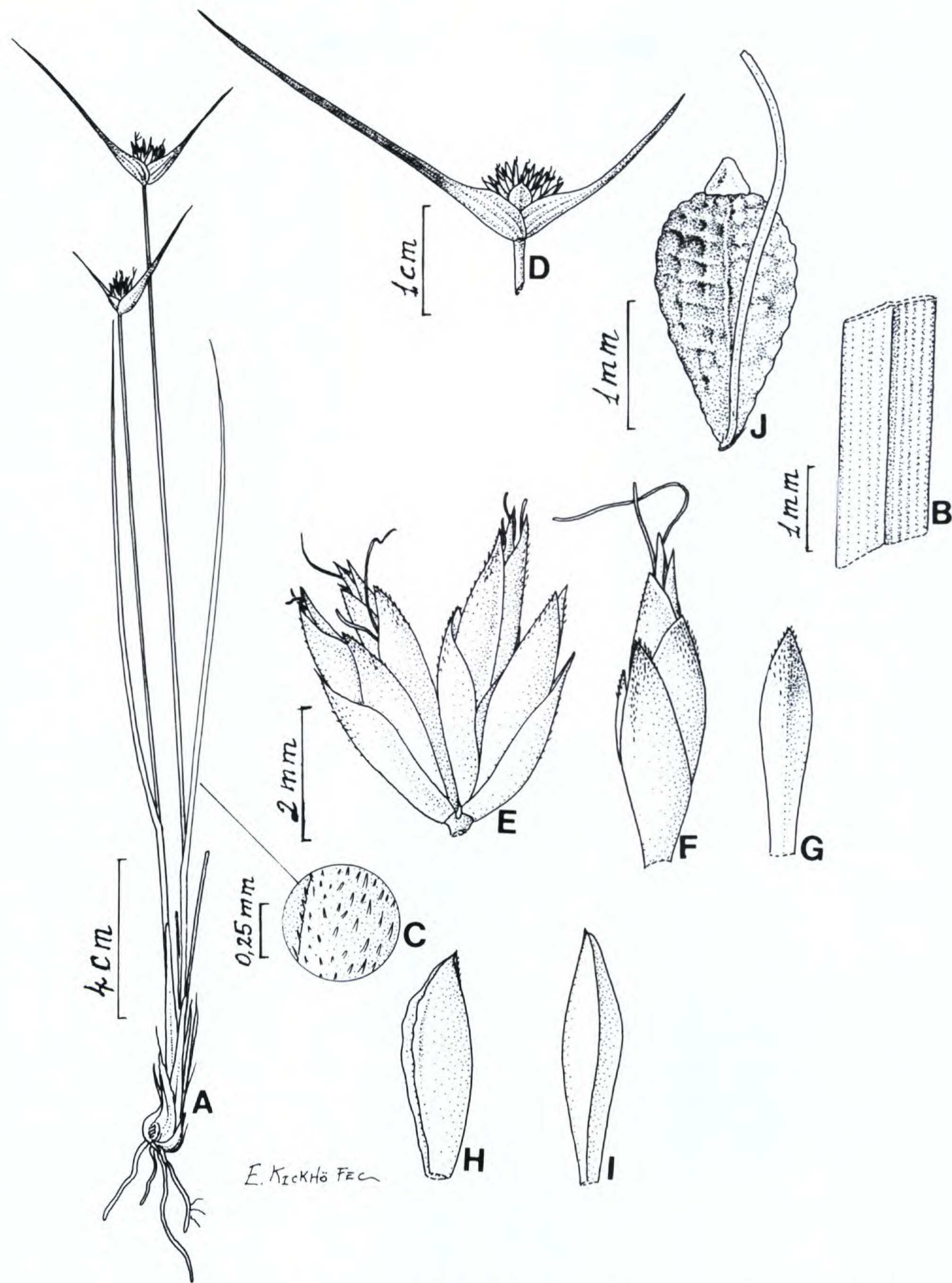


Figure 2. *Rhynchospora paranaënsis* A. C. Araújo & W. W. Thomas. —A. Habit. —B. Detail of the leaf blade. —C. Detail of the surface of the leaf blade. —D. Capitulum. —E. Group of spikelets. —F. Spikelet. —G. Basal empty spikelet scale. —H. Spikelet scale subtending achene. —I. Spikelet scale subtending lowest staminate flower. —J. Achene. (Based on G. Hatschbach 22332.)

scabrous along the keel, the apex acute; scale of staminate flowers stramineous, the basal one chartaceous, the others membranous. Perianth bristles absent. Anthers 2.6 mm long. Achenes 1.8 × 1 mm, obovate, biconvex, ochraceous, the surface tu-

berculate, the margins not prominent, straight; style base 0.2–0.3 × 0.3 mm, conical, not decurrent, confluent along margins of the achene.

The type material of *Rhynchospora paranaënsis*

was collected over 30 years ago and was identified as the similar *R. warmingii* Boeckeler. *Rhynchospora paranaënsis*, however, differs from *R. warmingii* in having leaf sheaths that do not disintegrate into fibers as they age; leaf blades and green portions of the involucre bracts that are flat and not convolute; spikelet scales that are scabrous; and the absence of perianth bristles. So far, *R. paranaënsis* is known only from two collections from the state of Paraná in southern Brazil. Although many attempts have been made to re-collect this species in the field, it has not been found again.

Paratype. BRAZIL. **Paraná:** Mun. Colombo, Rio Canguiri, 3 Oct. 1966, G. Hatschbach 17262 (MBM).

In addition to the two new species described above, the following two combinations are proposed here for the first time.

Rhynchospora elatior* var. *brevispiculosa (Kükenthal) A. C. Araújo, comb. nov. Basionym: *Rhynchospora diamantina* var. *brevispiculosa* Kükenthal, Feddes Repert. Spec. Nov. Regni Veg. 53: 72. 1944. TYPE: [Brazil.] Minas Gerais: Conselheiro Matta auf moorigem Sandboden, 1200 m, June, *Brade 13515* (lectotype, designated here, RB).

Haplostylis minor Nees, in Martius, Fl. Brasil. 2: 129. 1842. Non *Rhynchospora minor* Nees (in Martius, Fl. Brasil. 2: 143. 1842), nec Nelmes (in Kew Bull. 1956: 533. 1957 nom. illeg.). TYPE: Brazil. Goiás: "Serra dos Cristais," *Pohl 5032* (holotype, W destroyed; fragment of type, B; photo of type, MO).

Haplostylis minor (Nees) Steudel, Syn. Pl. Glum. 2: 143. 1855, nom. illeg.

Rhynchospora leucostachys Boeckeler, All. Bot. Zeitschr. 2: 79. 1896. TYPE: "Brasilia: Minas," *Glaziov 20047* (holotype, C; isotype, K, photos of type: F, MO).

Rhynchospora diamantina Kükenthal, Repert. Spec. Nov. Regni Veg. 53: 72. 1944. TYPE: Paraguay. "Am Oberlauf des Flusses Apa," Oct. 1901, *Hassler 7698* (lectotype, designated here, NY; isotypes, K, MO, P). Syntypes: "Rio Apa und Rio Aquidaban, Villa Sana," 21 Jan. 1909, K. Fiebrig 4676 (B fragment, K, M, P); Brazil. Minas Gerais: "Sierra do Catun," 900 m, 10 Nov. 1938, *F. Markgraf 3303* (RB? not seen); Brazil. Minas Gerais: "Riacho das Varas und Sopa, Diamantendistrikt," 22 Mar. 1892, W. Schwacke 8432 (RB? not seen).

Rhynchospora elatior includes plants from 0.7 to 1.5 m tall, with large, bulbous rhizomes, culms 4–7 mm wide, leaf blades 7–11 mm wide, and capitula 12–30 mm wide with 100 to 150 spikelets. This variable species was divided into four varieties by Kükenthal (1949): the typical variety, *R. elatior* var. *burchelli* (C. B. Clarke) Kükenthal, *R. elatior* var. *hirsuta* Nees, and *R. elatior* var. *variegato-pes* Pfeiffer. Although recent study of *R. elatior* (Araújo,

2001) supports only the separation of one of the varieties Kükenthal recognized (*R. elatior* var. *hirsuta* Nees), another taxon, commonly identified as *R. diamantina* Kükenthal, is here proposed as another variety of *R. elatior*: *R. elatior* var. *brevispiculosa*. This variety occurs in campo rupestre vegetation over 1000 m elevation in the state of Minas Gerais and is common near the town of Diamantina. Plants of this variety are small (20–55 cm tall), have few spikelets per capitulum (20 to 25), have narrow and short leaf blades, and are basally distichous. Plants of *R. elatior* var. *elatior* from the states of Goiás and Bahia are more robust: 70–140 cm tall, 100 or more spikelets per inflorescence, and leaf blades that are larger and rosulate. There are, however, no morphologically discontinuous characters between the Diamantina populations and the populations to the north and west.

Plants with the morphology of *Rhynchospora elatior* var. *brevispiculosa* were first described as *Haplostylis minor* Nees (1842). Steudel (1855) transferred this species to *Rhynchospora*, proposing an illegitimate combination—the species *R. minor* Nees had previously been described. Boeckeler (1896) described a new species, *R. leucostachys*, citing as the type *Glaziov 20047*, which matches this taxon in all respects. However, having not seen the type of *R. leucostachys* Boeckeler, Kükenthal (1944) described a new species typified by similar collections as *R. diamantina*. Despite being accepted as a good species by many authors (usually under the name of *R. diamantina*), study of a much larger body of collections than was previously available confirms that there is no clear morphological discontinuity in any taxonomic character that would permit the recognition of these two entities as distinct species.

The new combination had to take the name *Rhynchospora elatior* var. *brevispiculosa*, even though the typical variety of *R. diamantina* is included in the synonymy. *Rhynchospora diamantina* was illegitimate when published because Kükenthal included as one of the syntypes the type of Boeckeler's earlier name, *R. leucostachys*. Therefore, the autonymic variety created when Kükenthal published *R. diamantina* var. *brevispiculosa* is also illegitimate and cannot be used. Boeckeler's *R. leucostachys* is legitimate but was never used to create a name at the varietal level. Likewise, Steudel's illegitimate *R. minor* was never the basis for any varietal names. Therefore, the name *brevispiculosa* is the earliest available name and must be used in recognizing this taxon as a variety of *R. elatior*.

The specimen *Brade 13515* was chosen as the lectotype of *Rhynchospora elatior* var. *brevispiculosa*

because *Pohl 5032*, a syntype, is, in fact, the type of *Haplostylis minor*.

Rhynchospora terminalis* var. *rosemariana (D. A. Simpson) A. C. Araújo, stat. nov. Basionym: *Rhynchospora rosemariana* D. A. Simpson, Kew Bull. 44: 289. 1989. TYPE: Brazil. Minas Gerais: Serra do Cipó, Santana do Riacho, 3 Mar. 1981, Mayo et al. SPF 19551 (holotype, SPF; isotype, K).

Simpson (1989) reported that *Rhynchospora rosemariana* and *R. terminalis* (Nees) Steudel were related but distinct species distinguishable by characters of the involucre, involucre bracts, spikelet scales, and achenes. Studies of herbarium collections as well as living populations show a greater variation within *R. terminalis* than previously recognized. This variation diminishes the diagnostic value of the characters Simpson used to separate the two species. The main characters used by Simpson (1989) to distinguish *R. rosemariana* from *R. terminalis* are: ciliate versus scabrous involucre bracts, capitula single versus fascicles of spikelets, and the achenes 3.4–4.7 versus 4–6 mm long.

The involucre bracts are basally glabrous in most collections of *Rhynchospora rosemariana* from the same population at “Serra do Cipó” (Minas Gerais). In *R. terminalis* the involucre bracts are normally scabrous, although some collections are also ciliate. The lowest one or two involucre bracts in *R. terminalis* may subtend separate small capitulae or small fascicles of spikelets. However, in some populations of this species only the single terminal capitulum is found.

The study has proved that there is wide variability in spikelet length in *Rhynchospora terminalis*, which encompasses the whole range of spikelet lengths for *R. rosemariana*. In the same way, the achene is greater in *R. terminalis* (4–6 mm), but there is an overlap in the size range between the two taxa.

Rhynchospora terminalis, typically from cerrados, is also known from areas of campo rupestre in Espinhaço Range, such as the Serra da Moeda (Moeda, Minas Gerais). While *R. rosemariana* is restricted to campos rupestres in the Serra do Cipó Mountain (Simpson, 1989), it was found in cerrado fields in Mato Grosso state, too.

The following characters can be used to distinguish *R. terminalis* var. *rosemariana* from the typical variety: plants glabrous versus glabrous to densely pilose; lamina 1.5–3 cm long versus 10–25 cm long; capitulum with 10 to 20 spikelets ver-

sus 10 to 40 spikelets; spikelet scale subtending achene dark castaneous versus stramineous to pale castaneous.

Material examined (*Rhynchospora terminalis* var. *rosemariana*). BRAZIL. **Mato Grosso:** Mun. Cuiabá, Serra Ricardo Franco, 25 set. 1978, P. Windisch 2129 (CH). **Minas Gerais:** Mun. Diamantina, para Curvelo, 11 milhas após Diamantina, 23 Dec. 1959, B. Maguire et al. 44764 (NY, SPF); Guinda, Curvelo-Diamantina, 23 Nov. 1985, W. Thomas et al. 4857 (MO, NY, SPF, US); BR 259, km 583, 10 Dec. 1997, A. C. Araújo & A. Zanin 1045 (ICN, SPF); Mun. Jaboticatubas, Parque Nacional da Serra do Cipó, 5 Mar. 1958, E. P. Heringer & Castellanos 6177 (UB, US); MG 010, da Vila Almeida para Conceição do Mato Dentro, entre os km 114 e 116, 10 Mar. 1969, G. Eiten & L. T. Eiten 10963 (UB); km 139, 8 June 1970, A. B. Joly et al. 306 (MBM, UEC); Mun. Paraopeba, Fazenda Rasgão, 30 out. 1959, E. P. Heringer 7272 (UB); Mun. Santana do Riacho, Parque Nacional da Serra do Cipó, MG 010, km 120, 16 fev. 1968, H. S. Irwin 20284 (F, MO, NY, RB, US); Fazenda Palácio, 18 out. 1972, G. Hatschbach et al. 28846 (MBM, MO, UEC), 14 May 1997, A. C. Araújo & F. A. Vitta 750 (ICN, SPF), 23 set. 1997, A. C. Araújo et al. 841 (ICN, SPF), 8 Dec. 1997, A. C. Araújo et al. 976 (ICN, SPF); Mun. São Roque de Minas, arredores do Parque Nacional da Serra da Canastra, 19 Mar. 1998, A. C. Araújo et al. 1115 (ICN, SPF).

Acknowledgments. We are thankful to Tarciso Filgueiras for the Latin descriptions, Eduardo Kickhöfel for the illustrations, and the following herbaria for loans of specimens: CH, F, ICN, INPA, MBM, MO, NY, RB, SPF, UB, UEC, UECB, and US. The first author thanks the Mellon Foundation and The New York Botanical Garden for a fellowship to study at The New York Botanical Garden.

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